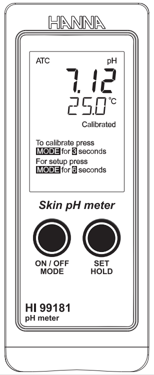
# Instruction Manual

# HI 99181

## Portable Waterproof Skin pH Meter




HANNA instruments
www.hannainst.com

## WARRANTY

All Hanna Instruments **meters are warranted for two years** against defects in workmanship and materials when used for their intended purpose and maintained according to instructions. **The probes are warranted for a period of six months.**

This warranty is limited to repair or replacement free of charge. Damage due to accidents, misuse, tampering or lack of prescribed maintenance are not covered.

If service is required, contact the dealer from whom you purchased the instrument. If under warranty, report the model number, date of purchase, serial number and the nature of the problem. If the repair is not covered by the warranty, you will be notified of the charges incurred. If the instrument is to be returned to Hanna Instruments, first obtain a Returned Goods Authorization Number from the Customer Service department and then send it with shipment costs prepaid. When shipping any instrument, make sure it is properly packaged for complete protection.



Dear Customer,

Thank you for choosing a Hanna Instruments Product.

Please read this instruction manual carefully before using the instrument. If you need additional technical information, do not hesitate to e-mail us at tech@hannainst.com.

## PRELIMINARY EXAMINATION

Remove the instrument from the packing material and examine it carefully to make sure that no damage has occurred during shipment. If noticeable damage is evident, notify your dealer.

Note: Save all packing material until you are sure that the instrument functions correctly. All defective items must be returned in the original packing together with the supplied accessories.

## GENERAL DESCRIPTION

**HI 99181** is a portable, microprocessor-based pH and temperature meter with a special flat surface probe.

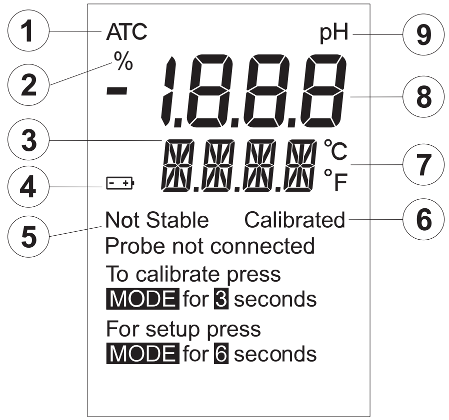
The **HI 1414D/50** probe has been specially designed with a flat tip for skin pH measurement.

Moreover, a built-in temperature sensor allows simultaneous temperature compensated pH and temperature readings and an integral pH sensor preamplifier provide measurements impervious to noise and electrical interferences.

The meter is supplied with:

- **HI 1414D/50** pH/temperature probe with flat tip, 50 mm-long body, DIN connector and 1m (3.3’) cable
- **HI 700621** Cleaning solution for skin grease and sebum, 20 mL sachet (2 pcs.)
- Calibration and cleaning solution sachets
- 3 x 1.5V AAA batteries
- Instruction manual.

## LCD DESCRIPTION




1. Automatic Temperature Compensation indicator
2. Battery percentage (visible at power up)
3. Secondary display
4. Low battery indicator
5. Stability indicator
6. pH calibration indicator
7. Selectable temperature unit
8. Primary display
9. Measuring unit for primary display

## SPECIFICATIONS

| | |
|---|---|
| Range | -2.00 to 16.00 pH<br>-5.0 to 105.0°C / 23.0 to 221.0°F |
| Resolution | 0.01 pH / 0.1°C / 0.1°F |
| Accuracy (@20°C/68°F) | ±0.02 pH<br>±0.5°C up to 60°C; ±1.0°C outside<br>±1.0°F up to 140°F; ±2.0°F outside |
| Typical EMC Deviation | ±0.02 pH<br>±0.2°C or ±0.4°F |
| Temperature Compensation | Automatic |
| pH Calibration | Automatic, 1 or 2 point choose between 2 sets of buffers (standard: 4.01/7.01/10.01 or NIST: 4.01/6.86/9.18) |
| Probe (included) | HI 1414D/50 preamplified pH/temperature probe |
| Battery Type | 3 x 1.5V AAA |
| Battery Life | Approximately 1200 hours of continuous use |
| Auto-off | After 8 minutes of non-use |
| Environment | 0 to 50°C (32 to 122°F); RH max. 100% |
| Dimensions | 152 x 58 x 30 mm (6.0 x 2.3 x 1.2”) |
| Weight | 205 g (7.2 oz.) |

## ACCESSORIES

| | |
|---|---|
| HI 1414D/50 | Preamplified pH probe with flat-tip 50 mm-long body, built-in temperature sensor, DIN connector and 1 m (3.3’) cable |
| HI 70004P | pH 4.01 buffer solution, 20 mL sachet (25 pcs.) |
| HI 7004L | pH 4.01 buffer solution, 500 mL bottle |
| HI 70006P | pH 6.86 buffer solution, 20 mL sachet (25 pcs.) |
| HI 7006L | pH 6.86 buffer solution, 500 mL bottle |
| HI 70007P | pH 7.01 buffer solution, 20 mL sachet (25 pcs.) |
| HI 7007L | pH 7.01 buffer solution, 500 mL bottle |
| HI 70300M | pH electrode Storage solution, 230 mL bottle |
| HI 70300L | pH electrode Storage solution, 500 mL bottle |
| HI 7061M | pH electrode General purpose cleaning solution, 230 mL bottle |
| HI 7061L | pH electrode Cleaning solution, 500 mL bottle |
| HI 700620P | Cleaning & disinfection solution for removal of skin residuals, 20 mL sachet (25 pcs.) |
| HI 70620M | Cleaning & disinfection solution for removal of skin residuals, 230 mL bottle |
| HI 70620L | Cleaning & disinfection solution for removal of skin residuals, 500 mL bottle |
| HI 700621P | Cleaning solution for removal of skin grease and sebum, 20 mL sachet (25 pcs.) |
| HI 70621M | Cleaning solution for removal of skin grease and sebum, 230 mL bottle |
| HI 70621L | Cleaning solution for removal of skin grease and sebum, 500 mL bottle |
| HI 70960 | Electrolyte solution for sample preparation, 30 mL bottle |
| HI 76405 | Electrode holder |

Hanna Instruments reserves the right to modify the design, construction and appearance of its products without advance notice.

IST99181Z 01/11

## OPERATIONAL GUIDE

First time you use the instrument open the battery compartment and put the batteries inside observing the polarity.

*To connect the probe*

With the meter turned off, connect the **HI 1414D/50** probe to the DIN socket on the bottom of the meter by aligning the pins and pushing in the plug. Tighten the nut to ensure a good connection. Remove the protective cap from the probe before taking any measurements.

*To turn the meter ON and check the battery status*

Press the **ON/OFF/MODE** button until the display lights up. At start-up, all the LCD segments are displayed for 1 second, then the percent indication of the remaining battery life is displayed for another second (E.g. "100 % BATT"). The meter then enters the normal measuring mode.

Note: If the display needs to be checked, keep the **ON** button pressed while turning the meter on. The meter will display all segments as long as the button is pressed.

*To freeze the display*

While in measurement mode, press the **SET/HOLD** button, "HOLD" appears on the secondary display and the reading will be frozen on the LCD (E.g. "pH 5.73 HOLD"). Press any button to return to normal mode.

*To turn the meter OFF*

While in normal measurement mode, press the **ON/OFF/MODE** button. "OFF" will appear on the secondary display. Release the button.

The meter is provided with an acoustic signal active when a key is pressed.

Notes:
- When the meter detects the absence of a temperature probe at its input, the message "Probe not connected" appears on LCD and the Automatic Temperature Compensation is turned off along with the "ATC" tag. In this condition, the secondary LCD displays "25.0°C " ("77°F") blinking. When the probe is reconnected, the "Probe not connected" tag is turned off, the temperature is displayed on the secondary display and the "ATC" tag is turned on.
- To clean the meter, do not use aggressive detergents. It is recommended to use water.

## pH MEASUREMENT & CALIBRATION

- Make sure the meter has been calibrated before use.
- If the probe is dry, soak it in **HI 70300** storage solution for 30 minutes to reactivate it.
- For better result, before taking any measurement, wet the skin portion to be tested with distilled water or **HI 70960** electrolyte solution.
- Place the flat tip of the probe that is wetted with the electrolyte solution on the sample to be tested and wait until the "Not Stable" tag on the LCD is turned off.
- The LCD displays the pH value (automatically compensated for temperature) on the primary LCD, while the secondary LCD displays the temperature of the sample.
- After each measurement, it is recommended to clean the probe tip with **HI 70620** and **HI 70621 Cleaning & disinfecting solutions**, to eliminate coatings and avoid cross-contamination.
- When not in use, switch the meter OFF and clean the probe with **HI 70620** and **HI 70621 Cleaning & disinfecting solutions** before storing it.

*pH calibration*

For better accuracy, frequent calibration of the pH sensor with the meter is recommended. In addition, the meter must be recalibrated:

a) Before each set of skin measurements.
b) Whenever the pH electrode is replaced or stored for long periods.
c) Where high accuracy is required.

- From normal mode, press and hold the **ON/OFF/MODE** button until "OFF" on the secondary display is replaced by "CAL". Release the button. Place the sensor into the first calibration buffer.
- The meter enters the calibration mode, displaying "pH 7.01 USE" (or "pH 6.86 USE" if the NIST buffer set was selected). After 1 second the meter activates the automatic buffer recognition feature. If a valid buffer is detected, then its value is displayed on the primary display, and "REC" appears on the secondary LCD. If no valid buffer is detected, the meter keeps the "USE" indication active for 12 seconds, and then replaces it with "---WRONG", indicating that the sample being measured is not a valid buffer.
- For a *single-point calibration* with buffers pH 4.01, 9.18 or 10.01, the meter automatically accepts the calibration when the reading is stable; the meter will show on the primary display the accepted buffer, with the message "OK 1" on the secondary display, and an audible signal is produced.
  If a single-point calibration with buffers pH 7.01 or 6.86 is desired, then after recognition of the buffer press any key to return to the pH measurement mode.

Note: It is always recommended to carry out a two-point calibration for better accuracy.

- For a *two-point calibration*, place the probe in pH 7.01 (or pH 6.86) buffer first. After the calibration point has been accepted, the "pH 4.01 USE" message appears. Place the sensor into the second calibration buffer. The message is held for 12 seconds, unless a valid buffer is recognized. If no valid buffer is recognized, then the "---WRONG" message is displayed. If a valid buffer (pH 4.01, pH 10.01 or pH 9.18) is detected, then the meter completes the calibration procedure. When the buffer is accepted, the LCD displays the accepted value with the "OK 2" message on the secondary display. The meter then returns to the normal measuring mode.

Note: When the calibration procedure is completed, the "Calibrated" tag is turned on.

*To exit calibration and reset default values*

- After entering the calibration mode and before the first point is accepted, it is possible to quit the procedure and return to the last calibration data by pressing the **ON/OFF/MODE** button. The secondary LCD displays "---ESC" for 1 second and the meter returns to normal mode.
- To reset to the default values and clear a previous calibration, press the **SET/HOLD** button after entering the calibration mode and before the first point is accepted.
  The secondary LCD displays "---CLR" for 1 second, the meter resets to the default calibration and the "Calibrated" tag on the LCD disappears.

## METER SETUP

Setup mode allows the selection of the temperature unit and the type of pH buffer set.

To enter the Setup mode, press and hold the **ON/OFF/MODE** button until "CAL" on the secondary display is replaced by "TEMP" and the current temperature unit (E.g. "TEMP °C"). Then:

- *for °C/°F selection*, use the **SET/HOLD** button. After the temperature unit has been selected, press **ON/OFF/MODE** to enter the buffer set selection mode; press **ON/OFF/MODE** twice to return to the normal measuring mode.
- *to change the type of calibration buffer set*, after setting the temperature unit, the meter will show the current buffer set: "pH 7.01 BUFF" (for standard buffer set: 4.01/7.01/10.01) or "pH 6.86 BUFF" (for NIST buffer set: 4.01/6.86/9.18). Change the set with the **SET/HOLD** button, then press **ON/OFF/MODE** to return to normal mode.

## BATTERY REPLACEMENT

The meter is supplied with batteries.

The meter displays the remaining battery percentage when turned on. When the level is below 5%, the " " symbol on the LCD blinks to indicate a low battery condition. If the battery level is low enough to cause erroneous readings, the Battery Error Prevention System (BEPS) turns the meter off. It is recommended to replace the batteries as soon as the display will flash the battery symbol.

To replace the batteries, follow the next steps:

- Open the battery compartment cap (on the bottom of the instrument).
- Remove old batteries.
- Replace new batteries observing the polarity on the rear of the instrument.
- Close the battery compartment cap.